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(51) INT CL<sup>4</sup>

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(52) Domestic classification

E2A 106 110 142 164 171 400 510 CAM

U1S 1142 E2A

(56) Documents cited

GB 1144513

(58) Field of search

E2A

(54) Buckles

(57) A buckle 10 comprises a male latching member 12 having one or more (preferably two) resiliently deflectable latching arms 24, a female latching member 14 having one or more (preferably two) retaining shoulders for allowing snap engagement with said one or more latching arms 24, and a release member 16 which is selectively slidable in said female latching member 14 longitudinally of said male latching member 12, in the direction of the arrow 26, to release the latching arms 24 from the retaining shoulders, the release member 16 simultaneously releasing both of the latching arms 24 and preferably being hidden from view against a wearer's body.

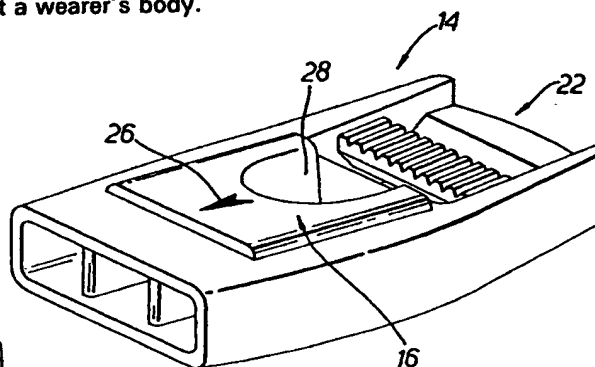
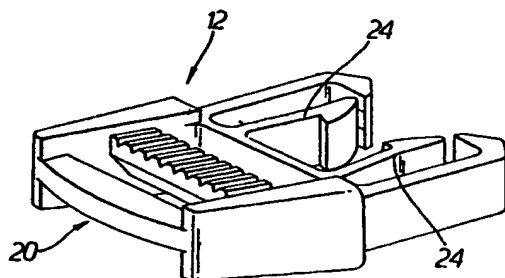
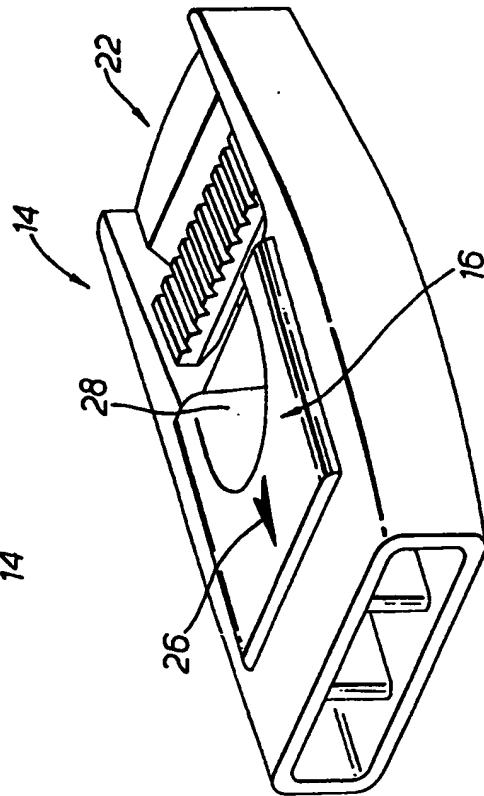
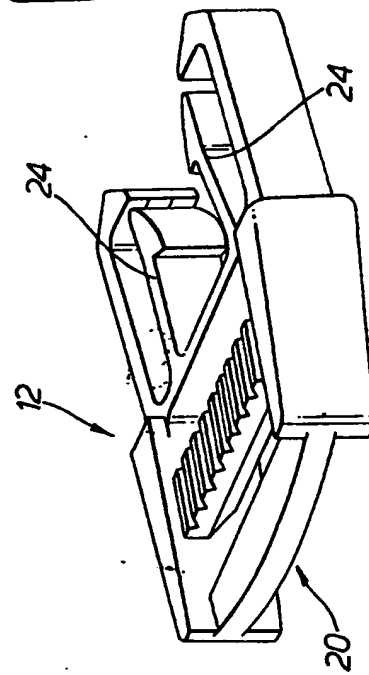
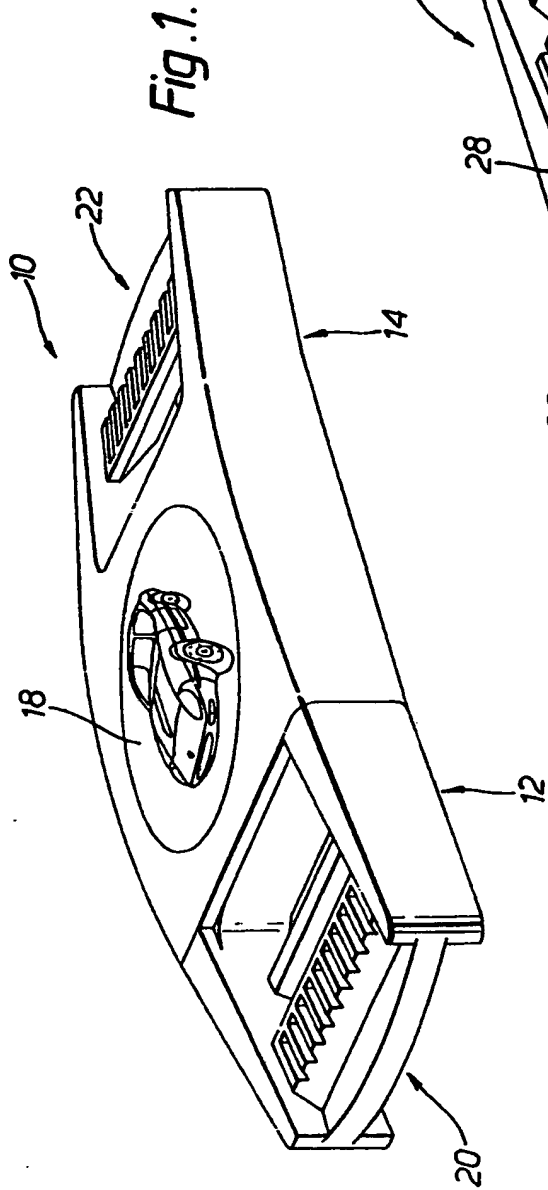


Fig.2.

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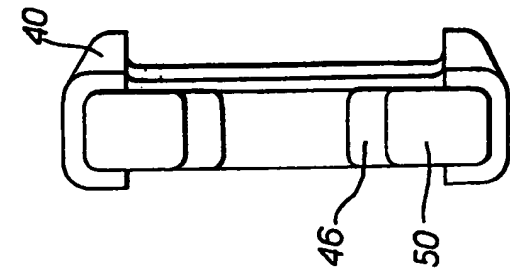


Fig. 5.

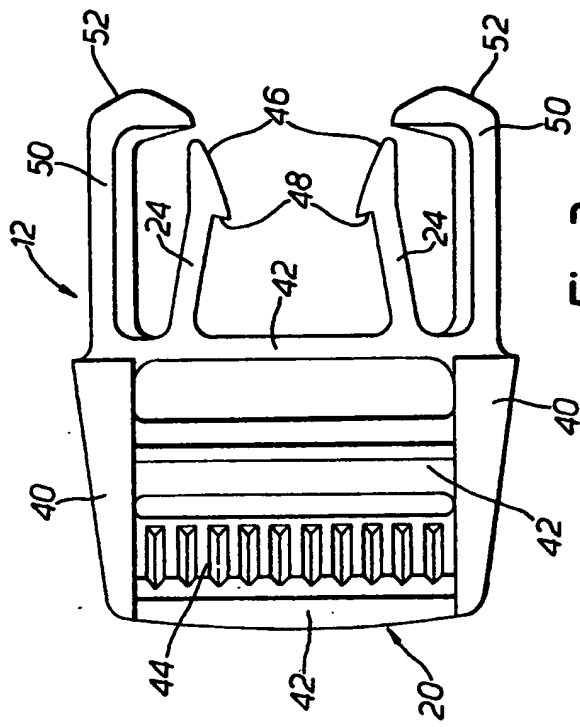


Fig. 3.

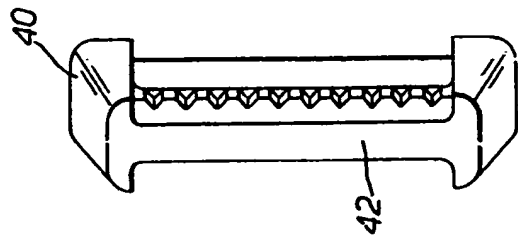


Fig. 4.

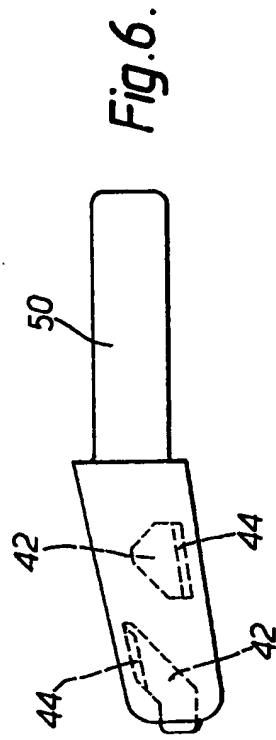


Fig. 6.

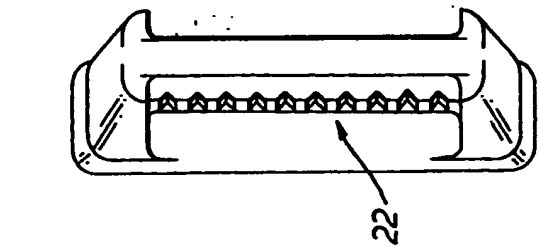


Fig. 9.

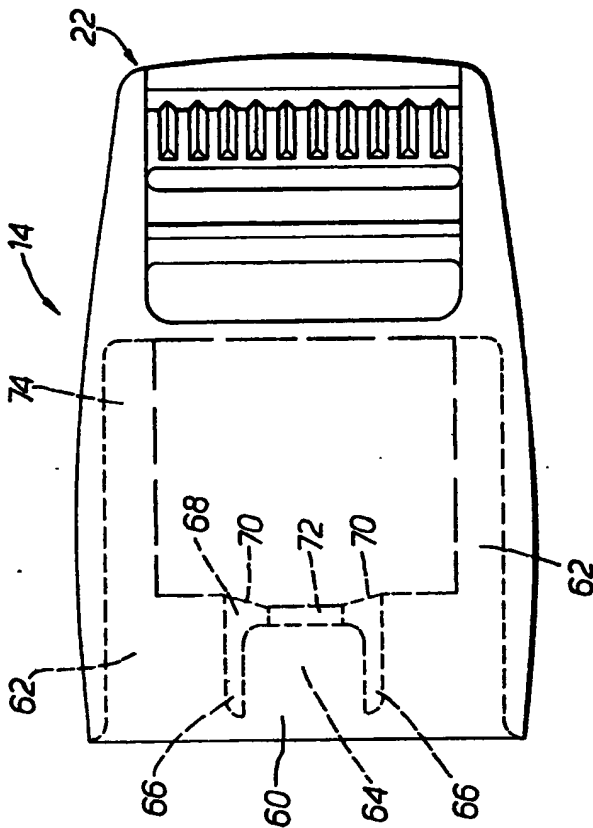


Fig. 7.

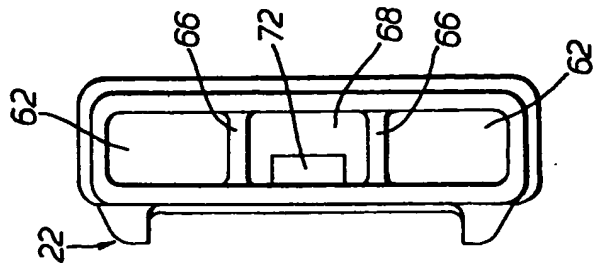


Fig. 8.

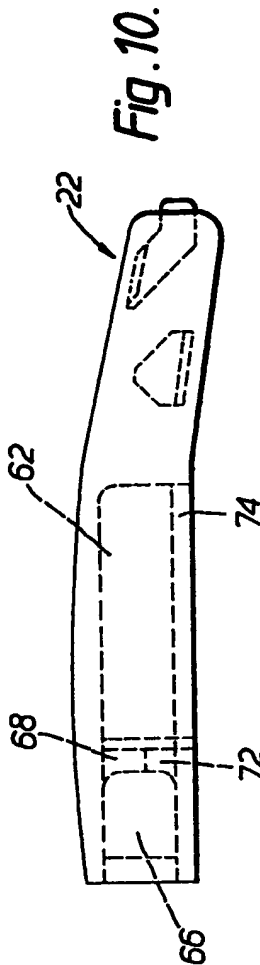
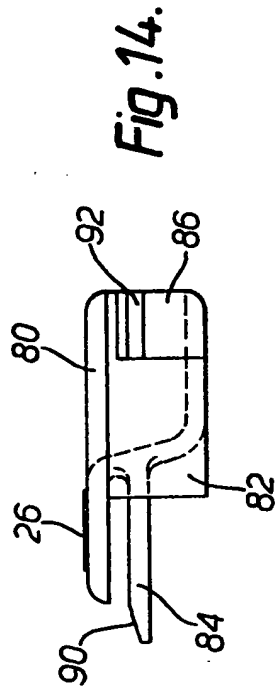
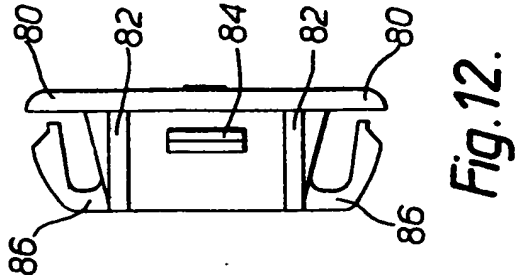
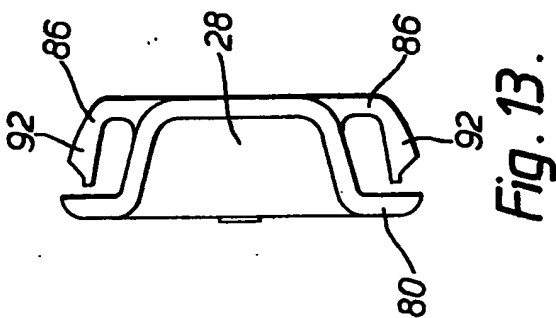
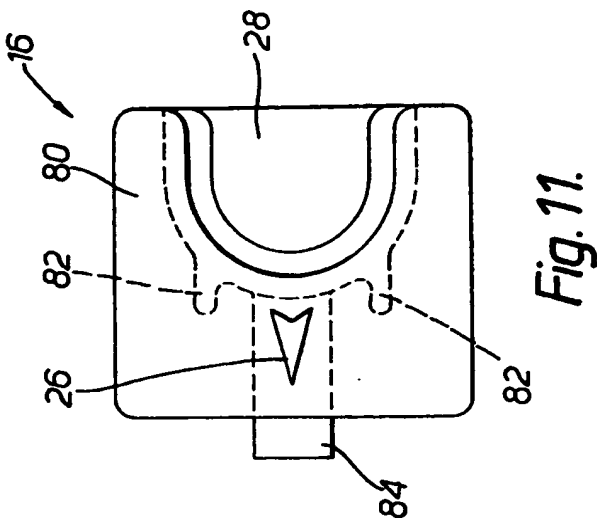
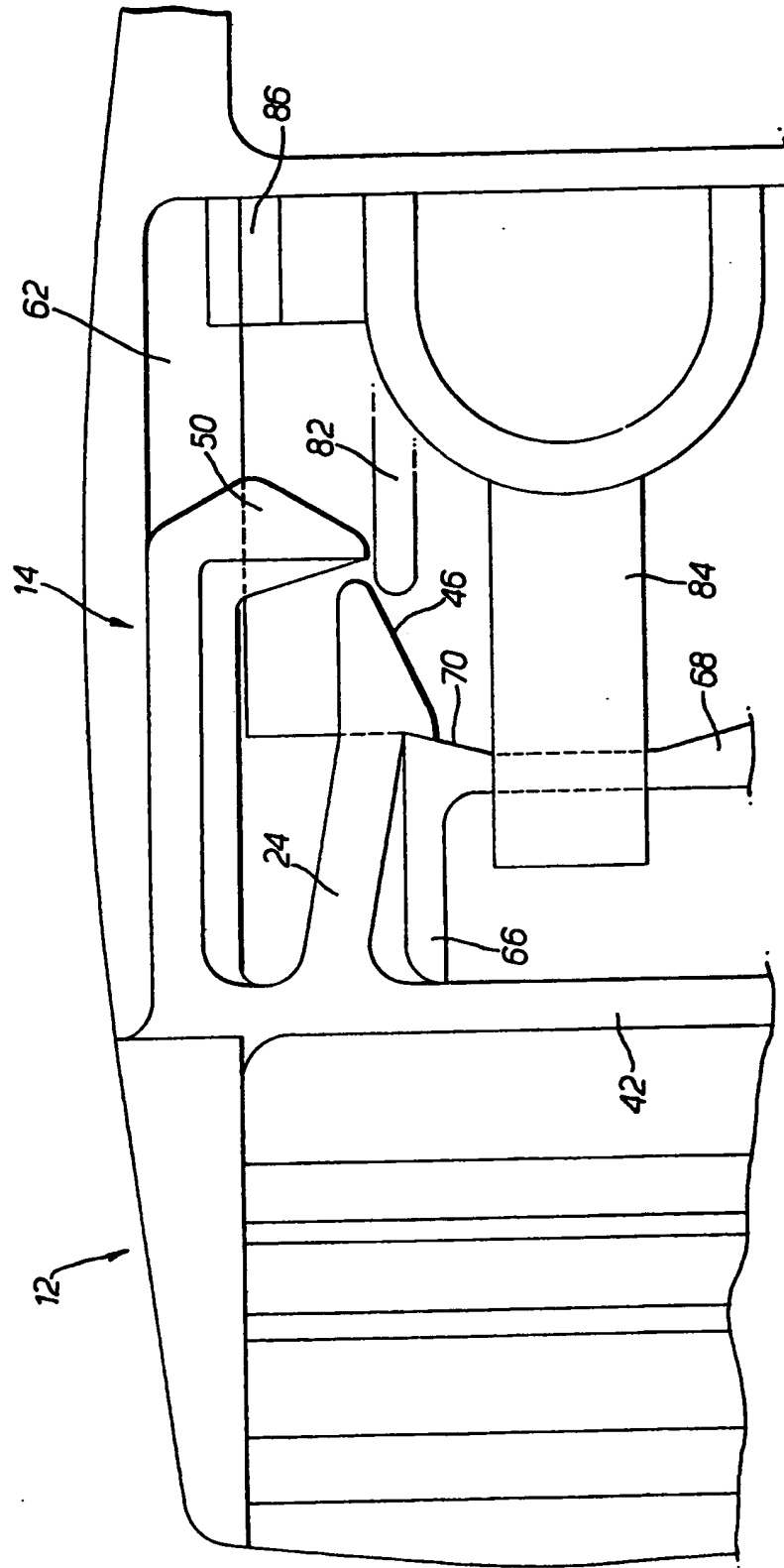


Fig. 10.





**Fig. 15.**

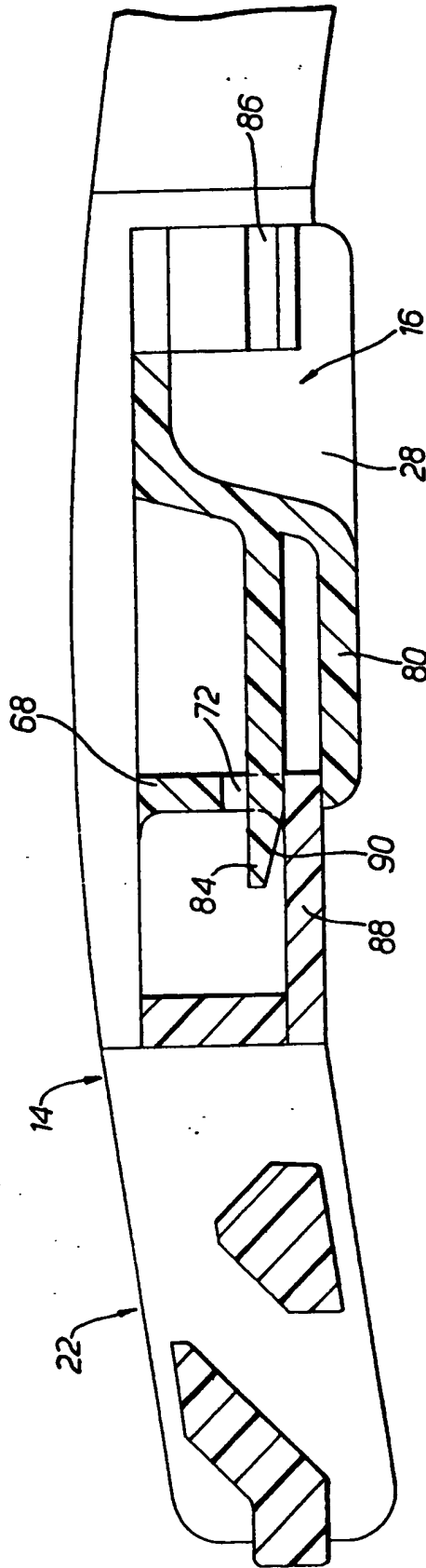


Fig. 17.

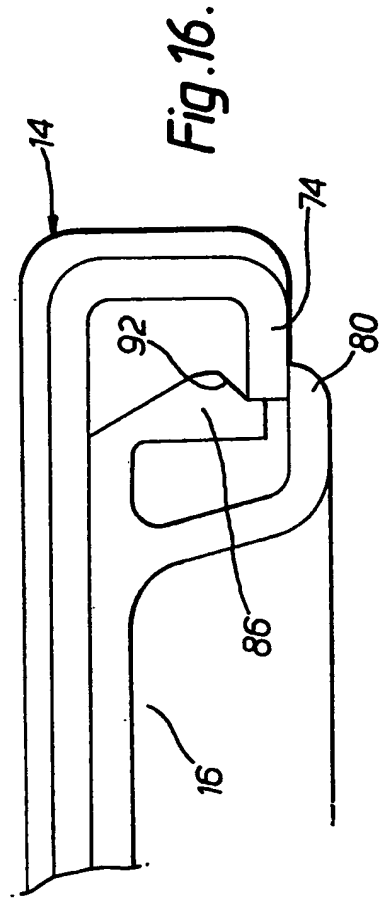


Fig. 16.

## SPECIFICATION

### Buckles

5 The present invention relates generally to buckles, and is more particularly concerned with buckles of the kind in which a male member can be pushed into snap engagement with a female member, the male and female members being detachable by operation of a press release.

An aim has been to provide a buckle of this kind with a particularly simple to use yet sturdy and reliable press release.

15 In accordance with the present invention, a buckle comprises a male latching member having one or more resiliently deflectable latching arms, a female latching member having one or more retaining shoulders for allowing snap engagement with said one or more latching arms, and a release member which is selectively slidable in said female latching member longitudinally of said male latching member to release said one or more latching arms from said one or more retaining shoulders.

The ease of use results partly from the fact that just a single release member is provided even though there may be a plurality of the latching arms to be detached.

It is also particularly significant that in the buckle of the present invention the release movement is directed longitudinally of the male latching member. In known buckles having just a single press release, the release movement is directed perpendicularly to the plane of the male latching member. That is to say, when such a known buckle is being used to secure the ends of a belt worn around a waist, release is effected by pressing part of the buckle towards the waist. Unfortunately, for many people the waist does not resist such pressure, with the result that such a known buckle can be very difficult to undo. This problem is not met by the buckle of the present invention.

Preferably, each of the male latching member, the female latching member and the release member is a one-piece moulding of a plastics material.

The male and female latching members may each include belt securing means and indeed the male and female latching members may each be contoured to fit snugly against a wearer's body.

The release member is preferably hidden from view but this is not essential even though it can lead to a buckle of more attractive appearance.

60 The male latching member may include a pair of the resiliently deflectable latching arms, each of whose free ends may include a camming surface as well as an undercut shoulder for abutment with a complementary retaining shoulder in the female latching

member. The camming surfaces may face one another. A pair of rigid arms may also be provided by the male latching member primarily to provide resistance to lateral movement of the male latching member when fully inserted in the female latching member.

70 The female latching member may include a pair of outer channels for receiving the latching arms, and the rigid arms if provided. A central recess may be separated from the outer channels by walls which co-operate with the camming surfaces to cause the latching arms to spread apart during insertion of the male latching member. A further wall extending between said aforementioned walls may present the retaining shoulders for the latching arms.

The release member may include means for assisting manipulation and preferably such means is a thumb recess although it could be for example a rib. The release member may be retained with the female latching member by a tongue at one end of the release member which co-operates with a slot through said further wall and by a pair of resilient legs at the other end which co-operate with respective flanges presented by the female latching member. The release member may also include a pair of delatching arms which co-operate with the latching arms, when the release member is slid longitudinally towards the male latching member, to force the latching arms out of engagement with the retaining shoulders.

100 It will be appreciated that the release member is easily slid backwards and forwards in the female latching member, the extent of this reciprocation possibly being of the order of 5 mm, movement in the direction of release being by thumb or finger pressure, and subsequent reverse movement during locking of the buckle being caused by insertion of the male latching member.

A buckle, in accordance with the present invention, will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a top perspective view showing the buckle in its secured condition;

115 Figure 2 is an underneath perspective view showing the buckle in its separated condition;

Figures 3 to 6 are respectively a top view of the male latching member, and left-hand end, right-hand end, and lower side views of Figure 3;

Figures 7 to 10 are respectively a top view of the female latching member, and left-hand end, right-hand end, and lower side views of Figure 7;

125 Figures 11 to 14 are respectively a bottom view of the release member, and left-hand end, right-hand end, and lower side views of Figure 11; and

Figures 15 to 17 are enlarged schematic details illustrating, respectively, engagement



of one of the latching arms on the male latching member with one of the retaining shoulders on the female latching member, engagement of one of the retaining legs on the release member with one of the flanges on the female latching member, and engagement of the tongue on the release member with the slot in the female latching member.

A buckle 10 in accordance with the present invention is shown in the accompanying drawings. Referring initially just to Figures 1 and 2, it can be seen that the buckle 10 includes a male latching member 12, a female latching member 14 and a release member 16. The male latching member 12 and the female latching member 14 may be contoured to fit snugly against a waist.

The release member 16 is here intended to be located on the underside or rear of the buckle 10 and will thus normally be hidden from view. What may be seen on the top of the female latching member 14 is a logo, such as circular transfer 18, which does not form part of the buckle 10 as claimed.

The male latching member 12 includes belt securing means 20 and the female latching member 14 includes belt securing means 22. It will be appreciated that the ends of a belt may be looped around the belt securing means 20 and 22, and may then be either permanently secured by for example stitching or be temporarily secured by tightening as usual. The short ends of the belt would preferably be hidden from view by being sandwiched between the waist and the remaining length of the belt.

The male latching member 12 includes one or more resiliently deflectable latching arms 24 (two shown) intended for snap engagement with one or more retaining shoulders (not shown) in the female latching member 14.

The buckle 10 is releasable from the secured condition of Figure 1, to the separated condition of Figure 2, by pressing the release member 16 in the direction of arrow 26 thereon. The arrow 26 is of course merely an optional feature. This pressure causes the release member 16 to slide in the female latching member 14 longitudinally of the male latching member 12 and release said one or more latching arms 24 from said one or more retaining shoulders. The actual details of the delatching will be described hereinafter. It should be noted at this point, however, that although a thumb recess 28 has been shown for ease of operation, the means for manipulation of the release member 16 could take other forms.

The male latching member 12 is shown by itself in Figures 3 to 6, and may be a one-piece moulding formed of the plastics material Nylon 6.6, the moulding including a pair of sidewalls 40 connected by three transverse bars 42.

It is the formation of the bars 42 and the openings therebetween which constitute the belt securing means 20. The left-hand bar 42 may carry a series of ribs 44 on its upper surface and likewise the central bar 42 may carry a series of ribs 44 on its lower surface. The purpose of the ribs is to resist slipping of a belt wrapped therearound. The main resistance to slipping, however, assuming that the belt has not been permanently fastened to the male latching member 12, is provided by the angled faces and the corners of the bars 42 by the series of ribs 44. The reader may care to refer to our parent company's granted British Patent 2 020 729 for a full discussion of how a belt can be secured to a buckle.

The right-hand bar 42 carries the previously mentioned pair of resiliently deflectable latching arms 24, each of whose free ends may include a camming surface 46 and an undercut shoulder 48. The shoulders 48 need not be undercut but such a shape assists in retention with complementary retaining shoulders provided in the female latching member. The camming surfaces 46 may face one another and cause the latching arms 24 to move apart when the male latching member 12 is inserted into the female latching member 14. When fully inserted, the latching arms 24 can snap back to their unstressed condition and allow the shoulders 48 to abut the complementary retaining shoulders provided in the female latching member 14.

A pair of outer rigid arms 50 may also be carried by the right-hand bar 42. The main purpose of the rigid arms 50 is to provide resistance to lateral movement of the male latching member 12 when fully inserted in the female latching member 14. However, sloping guide surfaces 52 may be provided on the rigid arms 50 to help in the initial location of the male latching member 12 in the female latching member 14. It will also be appreciated that the rigid arms 50 provide some protection for the latching arms 24 in the event that the male latching member 12 is mishandled.

The female latching member 14 is shown by itself in Figures 7 to 10, and may be a one-piece moulding formed of the plastics material Nylon 6.6, the moulding operation requiring the use of two side cores.

One end of the female latching member 14 constitutes the belt securing means 22, which is preferably of closely similar formation to the above-described belt securing means 20. The other end of the female latching member 14 has a mouth 60 into which the male latching member 12 is to be inserted. The mouth 60 is formed by a first side core which has three longitudinally projecting elements, the outer elements defining channels 62 for receiving the latching arms 24 and the rigid arms 50, with the inner element having a tab at its free end and defining a recess 64 having an

elongation. Each of the channels 62 is separated from the recess 64 by a wall 66. The outline of the first side core is indicated in dotted lines in Figure 7. The underside of the female latching member 14 is cored out by a second side core whose outline is indicated in dashed lines in Figure 7. The effect of this second side core is to cause the walls 66 to be joined by a wall 68 presenting retaining shoulders 70, and to cause the recess elongation to become a slot 72 through the wall 68. As shown in Figure 10, the co-operation of the first and second side cores also causes the underside of the female latching member 14 to present an opposed pair of flanges 74, which may be useful in retaining the release member 16 as described hereinafter.

The reader will already have realised how the male and female latching members 12 and 14 snap engage. The reader should nevertheless refer to Figure 15 and bear in mind that it is the initial abutment of the walls 66 with the camming surfaces 46 which causes the latching arms 24 to spread apart until their shoulders 48 can snap into abutment with the retaining shoulders 70. The reader will also appreciate that the rigid arms 50 do not themselves lock in the female latching member 14 but merely abut the side walls of the channels 62 to resist undue lateral movement of the male latching member 12.

The release member 16 is shown by itself in Figures 11 to 14, and may be a one-piece moulding of the plastics material Acetal, a part of which may be of sparked finish to present the previously mentioned arrow 26.

The thumb recess 28 is defined by one face of an extensive curved wall 80, whose other face has a pair of parallel delatching arms 82 extending longitudinally therefrom, as well as a central longitudinally extending tongue 84, and a pair of laterally arranged resilient legs 86.

To assemble the release member 16 to the female latching member 14, the tongue 84 is introduced into the slot 72 and the resilient legs 86 are pushed into snap retention with the flanges 74, as shown in Figures 16 and 17.

More particularly, a part 88 of the underside of the female latching member 14 is sandwiched between the wall 80 of the release member 16 and the tongue 84 of the release member 16, the leading end of the tongue 84 possibly being chamfered at 90 to assist in the introduction. Moreover, each of the flanges 74 presented by the female latching member 14 is sandwiched between the wall 80 of the release member 16 and one of the resilient legs 86 of the release member 16, the free end of each of the resilient legs 86 possibly being shaped by provision of a shoulder 92 to facilitate said retention.

To release the buckle 10 from the secured condition of Figure 1, the release member 16

is slid to the left as shown in Figure 15. This causes the delatching arms 82 to engage the camming surfaces 46 on the latching arms 24 and with continued pressure exerted on the release member 16 causes the latching arms 24 to buckle or otherwise deform or deflect out of engagement with the retaining shoulders 70.

The release member 16 is guided during both forwards and backwards movement by the co-operation of the tongue 84 with the slot 72, the resilient legs 86 with the flanges 74 and the fact that the wall 80 of the release member 16 abuts the underside of the female latching member 14.

#### CLAIMS

1. A buckle comprising a male latching member having one or more resiliently deflectable latching arms, a female latching member having one or more retaining shoulders for allowing snap engagement with said one or more latching arms, and a release member which is selectively slidable in said female latching member longitudinally of said male latching member to release said one or more latching arms from said one or more retaining shoulders.

2. A buckle according to claim 1, in which the release member is operable to release a plurality of the latching arms.

3. A buckle according to claim 2, in which the male latching member includes a pair of the resiliently deflectable latching arms, each of whose free ends includes a camming surface as well as a shoulder for abutment with a retaining shoulder in the female latching member.

4. A buckle according to claim 3, in which the camming surfaces face one another.

5. A buckle according to claim 3 or claim 4, in which the male latching member further includes a pair of rigid arms for providing resistance to lateral movement of the male latching member when fully inserted in the female latching member.

6. A buckle according to any one of claims 3 to 5, in which the female latching member includes a pair of outer channels for receiving the latching arms, and the rigid arms if provided.

7. A buckle according to claim 6, in which a central recess in the female latching member is separated from the outer channels by walls which co-operate with the camming surfaces to cause the latching arms to spread apart during insertion of the male latching member.

8. A buckle according to claim 7, in which the walls separating the central recess from the outer channels are joined by a further wall which presents the retaining shoulders for abutment with the latching arms.

9. A buckle according to any one of claims 3 to 8, in which the release member includes

a pair of delatching arms which co-operate with the latching arms, when the release member is slid longitudinally towards the male latching member, to force the latching arms out of engagement with the retaining shoulders.

5  
10 10. A buckle according to any preceding claim, in which the release member includes means for assisting manipulation in the form of a thumb recess.

11. A buckle according to any preceding claim, in which the release member is retained with the female latching member by a tongue at one end of the release member  
15 which co-operates with a slotted portion of the female latching member and by a pair of resilient legs at the other end of the release member which co-operate with respective flanged portions of the female latching member.  
20

12. A buckle according to any preceding claim, in which each of the male latching member, the female latching member and the release member is a one-piece moulding of a plastics material.  
25

13. A buckle according to any preceding claim, in which each of the male and female latching members includes belt securing means.

30 14. A buckle according to any preceding claim, in which each of the male and female latching members is contoured with the intention of fitting snugly against a wearer's body.

15. A buckle according to any preceding claim, in which the release member is located with the intention of being hidden from view against a wearer's body.

35 16. A buckle substantially as hereinbefore described with reference to the accompanying  
40 drawings.